UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Group: Attorney Docket # 1899

Applicant(s) : WENDT, D., ET AL

Serial No. :

Filed :

For : PIEZOELECTRIC ELEMENT WITH A MULTI-LAYER STRUCTURE OF PIEZOELECTRIC PLIES...

SIMULTANEOUS AMENDMENT

December 6, 2001

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R S:

Simultaneously with filing of the above identified application please amend the same as follows:

In the Claims:

Cancel all claims without prejudice.

Substitute the claims attached hereto.

REMARKS:

This Amendment is submitted simultaneously with filing of the above identified application.

With the present Amendment applicant has amended the claims so as to eliminate their multiple dependency.

Consideration and allowance of the present application is most respectfully requested.

Respectfully submitted,

Michael J. Striker
Attorney for Applicant(s)
Reg. No. 27233

Claims

1. Tool receiver for a grinder, in particular for a handheld angle grinder (10) having a carrier device (12, 14, 16, 182, 184, 300) via which an application tool (18, 32, 186, 188) can be actively connected to a drive shaft (54), characterized in that the application tool (18, 32, 186, 188) can be actively connected to the carrier device (12, 14, 16, 182, 184, 300) via at least one detent element (24, 26, 190, 192, 194, 196, 198, 200, 302) that can be moved against a spring force, that snaps into place in an operating position of the application tool (18, 32, 186, 188) and immobilizes the application tool (18, 32, 186, 188) with positive engagement.

2. Tool receiver for a grinder according to claim 1, characterized in that the spring force acts in the axial direction (44).

3. Tool receiver for a grinder according to claim 1 [or 2], characterized in that a drive torque can be transferred via a positive connection between the application tool (18, 32, 186, 188) and the carrier device (14, 16, 182, 184, 300).

4. Tool receiver for a grinder according to [one of the preceding claims] claim 1, characterized in that the application tool (186, 188) can be connected to the carrier device (182, 184) via at least one carrier element (202, 204, 206, 208, 210, 212) located on the application tool (186, 188) and/or the carrier device (182, 184) extending in the axial direction (38), that it can be guided through at least one area of a slot (214, 216, 218, 220, 222, 224) of the corresponding counter-component (186, 188), moved along the slot (214, 216, 218, 220, 222, 224) and immobilized in an end position by means of the detent element (190, 192, 194, 196, 198, 200).

5. Tool receiver for a grinder according to claim 4, characterized in that the application tool (186, 188) can be immobilized with positive engagement in the

axial direction (38) via a seating surface (226, 278) of the carrier element (202, 204, 206, 208, 210, 212).

6. Tool receiver for a grinder according to claim 4 [or 5], characterized in that the detent element (190, 192, 194, 196, 198, 200) is formed by an elastically deformable component (228, 230).

7. Tool receiver for a grinder according to claim 6, characterized in that at least one detent element (190, 192, 194, 196, 198, 200) producing the spring force is designed integrally connected to a tool hub (228, 230) of the application tool (186, 188).

8. Tool receiver for a grinder according to claim 7, characterized in that at least one recess (236) is provided in a component (234) of the carrier device (184) forming a bearing surface (232) for the application tool (188), into which a part of the tool hub (230) is elastically pressed in an operating position of the application tool (188).

9. Tool receiver for a grinder according to claim 7 [or 8], characterized in that the slot (214, 216, 218, 220, 222, 224) is provided in the tool hub (228, 230) of the application tool (186, 188), and at least one detent element (190, 192, 194, 196, 198, 200) is formed by a part of the tool hub (228, 230) in the vicinity of the slot (214, 216, 218, 220, 222, 224).

10. Tool receiver for a grinder according to claim 9, characterized in that the slot (220, 222, 224) comprises a wide area (238, 240, 242) and at least one narrow area in front of an end position (250, 252, 254) of the carrier element (208, 210, 212) that forms the detent element (196, 198, 200).

11. Tool receiver for a grinder according to [one of the preceding claims]

claim 1, characterized in that at least one detent element (24, 26, 302) is supported in a fashion that allows it to move against a spring element (20, 22, 312).

12. Tool receiver for a grinder according to claim 11, characterized in that the detent element (24, 26, 302) can be released from its locked position using a release button (28, 30).

13. Tool receiver for a grinder according to claim 11 [or 12], characterized in that the application tool (18) is connected to the carrier device (12, 14, 300) in the circumferential direction (34, 36) via at least a first element (24, 302) and, in the axial direction (38), via at least a second element (40, 42, 306).

14. Tool receiver for a grinder according to [one of the preceding claims] claim 1, characterized in that at least one detent element (302) is integrally moulded on a discoid component (304).

15. Tool receiver for a grinder according to [one of the preceding claims] claim 1, characterized in that at least two elements (306) for immobilizing the application tool in the axial direction (38) are integrally moulded to a discoid component (308).

16. Tool receiver for a grinder, in particular an angle grinder (10), that can be connected to a tool hub (52, 94, 228, 230) via a carrier device (12, 14, 16, 182, 184, 300) of a tool receiver for a grinder with a drive shaft (54) of a grinder (10), characterized in that the tool hub (52, 94, 228, 230) can be effectively connected to the carrier device (12, 14, 16, 182, 184, 300) via at least one detent element (24, 26, 190, 192, 194, 196, 198, 200, 302) that can be moved against a spring force, that snaps into place in an operating position of the tool hub (52, 94, 228, 230) and immobilizes the tool hub (52, 94, 228, 230) with positive engagement.

17. Tool receiver for a grinder according to claim 16, characterized in that at least one detent element (190, 192, 194, 196, 198, 200) is formed at least partially by the tool hub (228, 230).

18. Tool receiver for a grinder according to claim 17, characterized in that at least one slot (220, 222, 224) is provided in the tool hub (230) that comprises a wide area (238, 240, 242) and at least one narrow area forming the detent element (196, 198, 200).

Claims

1. Tool receiver for a grinder, in particular for a handheld angle grinder (10) having a carrier device (12, 14, 16, 182, 184, 300) via which an application tool (18, 32, 186, 188) can be actively connected to a drive shaft (54), characterized in that the application tool (18, 32, 186, 188) can be actively connected to the carrier device (12, 14, 16, 182, 184, 300) via at least one detent element (24, 26, 190, 192, 194, 196, 198, 200, 302) that can be moved against a spring force, that snaps into place in an operating position of the application tool (18, 32, 186, 188) and immobilizes the application tool (18, 32, 186, 188) with positive engagement.

2. Tool receiver for a grinder according to claim 1, characterized in that the spring force acts in the axial direction (44).

3. Tool receiver for a grinder according to claim 1, characterized in that a drive torque can be transferred via a positive connection between the application tool (18, 32, 186, 188) and the carrier device (14, 16, 182, 184, 300).

4. Tool receiver for a grinder according to claim 1, characterized in that the application tool (186, 188) can be connected to the carrier device (182, 184) via at least one carrier element (202, 204, 206, 208, 210, 212) located on the application tool (186, 188) and/or the carrier device (182, 184) extending in the axial direction (38), that it can be guided through at least one area of a slot (214, 216, 218, 220, 222, 224) of the corresponding counter-component (186, 188), moved along the slot (214, 216, 218, 220, 222, 224) and immobilized in an end position by means of the detent element (190, 192, 194, 196, 198, 200).

5. Tool receiver for a grinder according to claim 4, characterized in that the application tool (186, 188) can be immobilized with positive engagement in the

axial direction (38) via a seating surface (226, 278) of the carrier element (202, 204, 206, 208, 210, 212).

6. Tool receiver for a grinder according to claim 4, characterized in that the detent element (190, 192, 194, 196, 198, 200) is formed by an elastically deformable component (228, 230).

7. Tool receiver for a grinder according to claim 6, characterized in that at least one detent element (190, 192, 194, 196, 198, 200) producing the spring force is designed integrally connected to a tool hub (228, 230) of the application tool (186, 188).

8. Tool receiver for a grinder according to claim 7, characterized in that at least one recess (236) is provided in a component (234) of the carrier device (184) forming a bearing surface (232) for the application tool (188), into which a part of the tool hub (230) is elastically pressed in an operating position of the application tool (188).

9. Tool receiver for a grinder according to claim 7, characterized in that the slot (214, 216, 218, 220, 222, 224) is provided in the tool hub (228, 230) of the application tool (186, 188), and at least one detent element (190, 192, 194, 196, 198, 200) is formed by a part of the tool hub (228, 230) in the vicinity of the slot (214, 216, 218, 220, 222, 224).

10. Tool receiver for a grinder according to claim 9, characterized in that the slot (220, 222, 224) comprises a wide area (238, 240, 242) and at least one narrow area in front of an end position (250, 252, 254) of the carrier element (208, 210, 212) that forms the detent element (196, 198, 200).

11. Tool receiver for a grinder according to claim 1, characterized in that at least one detent element (24, 26, 302) is supported in a fashion that allows it to move against a spring element (20, 22, 312).

12. Tool receiver for a grinder according to claim 11, characterized in that the detent element (24, 26, 302) can be released from its locked position using a release button (28, 30).

13. Tool receiver for a grinder according to claim 11, characterized in that the application tool (18) is connected to the carrier device (12, 14, 300) in the circumferential direction (34, 36) via at least a first element (24, 302) and, in the axial direction (38), via at least a second element (40, 42, 306).

14. Tool receiver for a grinder according to claim 1, characterized in that at least one detent element (302) is integrally moulded on a discoid component (304).

15. Tool receiver for a grinder according to claim 1, characterized in that at least two elements (306) for immobilizing the application tool in the axial direction (38) are integrally moulded to a discoid component (308).

16. Tool receiver for a grinder, in particular an angle grinder (10), that can be connected to a tool hub (52, 94, 228, 230) via a carrier device (12, 14, 16, 182, 184, 300) of a tool receiver for a grinder with a drive shaft (54) of a grinder (10), characterized in that the tool hub (52, 94, 228, 230) can be effectively connected to the carrier device (12, 14, 16, 182, 184, 300) via at least one detent element (24, 26, 190, 192, 194, 196, 198, 200, 302) that can be moved against a spring force, that snaps into place in an operating position of the tool hub (52, 94, 228, 230) and immobilizes the tool hub (52, 94, 228, 230) with positive engagement.

17. Tool receiver for a grinder according to claim 16, characterized in that at least one detent element (190, 192, 194, 196, 198, 200) is formed at least partially by the tool hub (228, 230).

18. Tool receiver for a grinder according to claim 17, characterized in that at least one slot (220, 222, 224) is provided in the tool hub (230) that comprises a wide area (238, 240, 242) and at least one narrow area forming the detent element (196, 198, 200).